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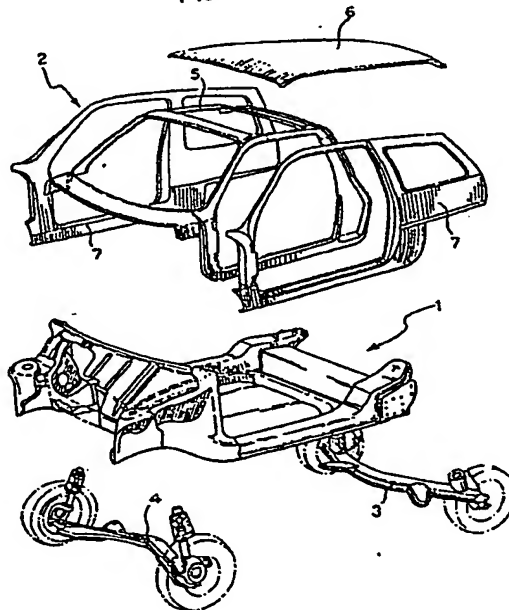
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(64) Motor vehicle with a load-bearing platform and body with elements of plastics material, and a method for its manufacture.

(57) Motor vehicle including a pre-assembled load-bearing platform (1) arranged to receive mechanical power and functional units and internal equipment, and an independently-assembled body (2) constituted by pre-assembled and finished sub-units including body elements of moulded plastics material (6, 7). The body (2) is joined to the load-bearing platform (1) by automated fixing techniques by means of adhesives with the possible assistance of mechanical connections other than welding.

FIG. 1



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Motor vehicle with a load-bearing platform and body with elements of plastics material, and a method for its manufacture.

The present invention relates generally to motor vehicles and methods for their manufacture.

The current techniques for assembling the component parts of a motor vehicle include several automated steps but still require considerable manual intervention. Furthermore, these techniques require corrosion protection, sound-proofing, and painting treatments to be carried out after the assembly of the structural elements constituting the vehicle body, after which the various functional units and internal equipment are assembled.

Such a production cycle is very long and requires expensive equipment, particularly for transporting the bodies to the painting and equipment lines.

Moreover, vehicles have already been proposed with bodies constituted by elements of moulded plastics material so as to reduce, among other things, the problems connected with the protective treatment and the painting of the body. However, in the proposed solutions, the conformation of the body reproduces conventional configurations of sheet metal bodies and the body is not able to ensure the necessary structural strength. In no case have any of these solutions arrived at a completely automated manufacturing system.

The object of the present invention is exactly that of providing a motor vehicle which is so formed as to enable it to be manufactured in a completely automated assembly cycle at the end of which special final treatments are not required.

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In order to achieve this object, the present invention provides a motor vehicle characterised in that it includes:

- 5 - a pre-assembled load-bearing platform arranged to receive, by automated assembly operations, mechanical power units as well as functional units and internal equipment for the vehicle, the platform being previously subjected to corrosion protection treatments, sound-proofing, and possible mechanical
10 adjustment operations, and
- an independently-assembled body constituted by pre-assembled and finished sub-units including body elements of moulded plastics material defining at least the roof and the sides of the vehicle, the body being
15 joined to the load-bearing platform by automated fixing techniques with adhesives and with the possible aid of mechanical connections other than welding which requires further painting and rust-proofing treatments.

The invention also has for its subject a method for
20 the manufacture of a motor vehicle, characterised in that it comprises the following steps:

- assembling a load-bearing platform arranged to receive, by automated assembly operations, mechanical power units as well as functional units and internal
25 equipment for the vehicle, and previously subjecting the platform to corrosion protection treatments, sound-proofing, and possible mechanical adjustment operations;
- assembling a body constituted by pre-assembled and
30 finished sub-units including body elements of moulded plastics material defining at least the roof and the sides of the vehicle,
- joining the body and the load-bearing platform by

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automated fixing techniques with adhesives and with the possible aid of mechanical connections other than welding which requires further painting and rust-proofing treatments,

- 5 - assembling the mechanical power units as well as the functional units and internal equipment for the vehicle before or after the joining of the body to the load-bearing platform,
- attaching any pre-assembled and finished parts for
10 completing the front and rear of the body.

The step of assembling the body may consist of providing a metal support framework and applying the moulded plastics elements to this metal framework, or of
15 providing the moulded plastics elements with metal support members and joining the elements of plastics material so as to form a support framework with the metal members.

The invention will now be described in detail with reference to the appended drawings, provided purely by
20 way of non-limiting example, in which:

Figure 1 is an exploded perspective view illustrating the essential components of a motor vehicle according to the invention, before assembly,

Figure 2 is a perspective view on an enlarged scale,
25 illustrating an intermediate step in the method of manufacture of the vehicle of Figure 1, according to a first embodiment of the method of the invention,

Figure 3 is a view similar to Figure 2 of another embodiment of the method of the invention, and

Figure 4 illustrates a variant of Figure 1.

Figure 1 shows the essential components of the motor vehicle according to the invention: in practice, these are constituted by a load-bearing platform and a body, generally indicated 1 and 2 respectively.

The platform 1 has the function, on the one hand, of constituting the element on which all the various mechanical units of the vehicle are assembled and, on the other hand, of constituting a base or floor of the vehicle itself. This platform 1 is constituted by a pre-assembled supporting structure subjected beforehand to corrosion protection and sound-proofing treatments, so that it does not have to undergo any further operations during assembly of the vehicle.

As stated, the platform 1 is arranged to allow the automatic assembly of both the mechanical power unit and the body 2 and any other sub-units of the body, such as, for example, the bumpers, engine compartment, etc., not illustrated.

Of the mechanical units to be fitted to the platform 1, Figure 1 illustrates solely the respective suspension units 3, 4 for the rear and front wheels, the manner in which they are connected to the platform being explained below.

The body 2, also assembled independently, is constituted by pre-assembled and finished sub-units including body elements of moulded plastics material for defining the roof and sides of the vehicle. In the case of Figure 1, the body 2 includes a metal support framework to which the body elements of moulded plastics

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material, constituted by the roof 6 and the two sides 7, are applied. Alternatively, it should be noted that, instead of being a pre-assembled element, the metal framework 5 could be formed from metal support members previously fixed to the elements of plastics material 6 and 7 and arranged to constitute the framework 5 as a result of the assembly of the elements 6 and 7.

The cycle of assembly of the vehicle 1, as stated, provides for the separate assembly of the platform 1 and the body 2 and their subsequent joining by non-welded connections by means of very thick elastomeric adhesives supplemented by a limited number of automatic screwing operations which have the function of ensuring that the assembled unit can be moved immediately after glueing. It is possible first to carry out the coupling of the framework 5 and the platform 1 and subsequently to assemble the body elements 6 and 7 and the front and rear suspension units 3 and 4 in the manner illustrated in Figure 2, or, alternatively, it is possible to complete the assembly of the body 2 and the platform 1 with the mechanical units 3 and 4 beforehand and then to join them as illustrated in Figure 3. This second solution is more advantageous in that it is possible to carry out various preliminary mechanical adjustments of the units 3 and 4 (as well as of other mechanical units previously mounted on the platform 1), avoiding the necessity of carrying out these operations subsequently.

The vehicle unit thus constituted is then completed by other front and rear body elements which are also of moulded plastics material, possibly by other components of the power unit, as well as by the various

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functional units and internal equipment of the vehicle. With regard to this, it should be stated that, to advantage, all the mechanical, functional and equipment units may be pre-assembled on the platform 1 before it is joined to the body 2 and the bodywork is completed.

The variant of the vehicle illustrated in Figure 4 is generally similar to the embodiment described above and differs from it only in that it has a different general conformation of the platform 1 and of the body 2. The latter, in addition to a metal framework 5 to which a pre-assembled unit 8 formed by the elements 6 and 7 of moulded plastics material is attached, also includes a floor 9 constituted by a moulded plastics monocoque provided with lateral metal elements 10 intended to be joined to the framework 5 to complete the side door openings.

The manner in which the body 2 is connected to the platform 1 in this case is similar to that described above.

In each case, the conformation of the vehicle according to the invention is such as to allow the various components to be assembled and joined together by completely automated techniques.

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CLAIMS

1. Motor vehicle characterised in that it includes:
 - a pre-assembled load-bearing platform (1) arranged to receive, by automated assembly operations, mechanical power units as well as functional units and internal equipment for the vehicle, the platform (1) being previously subjected to corrosion protection treatments, sound-proofing, and possible mechanical adjustment operations, and
 - an independently-assembled body (2) constituted by pre-assembled and finished sub-units including body elements (6,7) of moulded plastics material defining at least the roof and the sides of the vehicle, the body (2) being joined to the load-bearing platform (1) by automated fixing techniques by means of adhesives with the possible aid of mechanical connections other than welding which requires further painting and rust-proofing treatments.
2. Motor vehicle according to Claim 1, characterised in that the body (2) further includes a floor constituted by a monocoque (10) of moulded plastics material.
3. Motor vehicle according to Claim 1, characterised in that the body (2) includes a metal support framework (5) for the body elements (6,7) of moulded plastics material.
4. Method for the manufacture of a motor vehicle characterised in that it comprises the following steps:
 - assembling a load-bearing platform (1) pre-arranged to receive, by automated assembly operations,

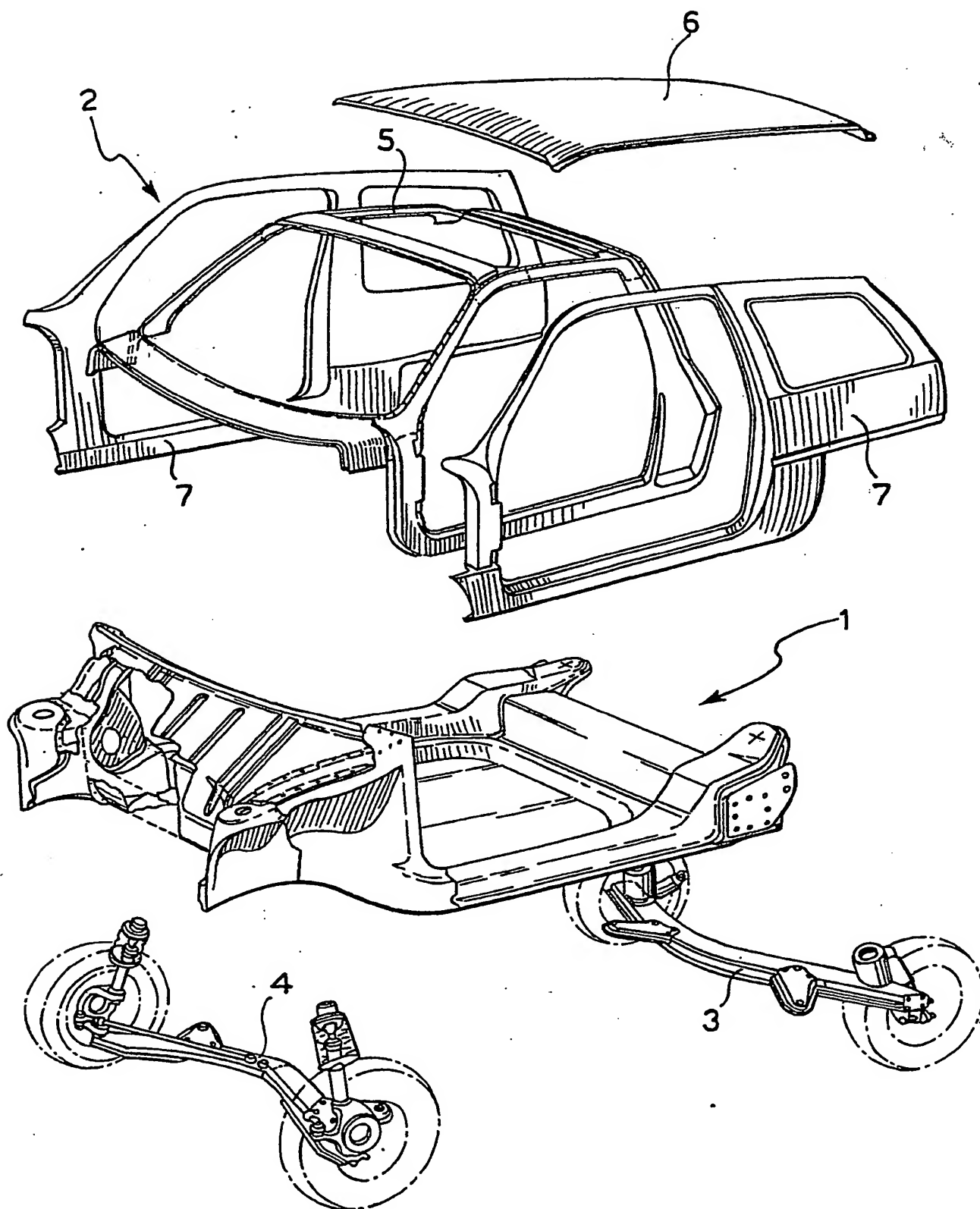
mechanical power units as well as functional units and internal equipment for the vehicle, and previously subjecting the platform (1) to corrosion protection treatments, sound-proofing, and possible mechanical adjustment operations;

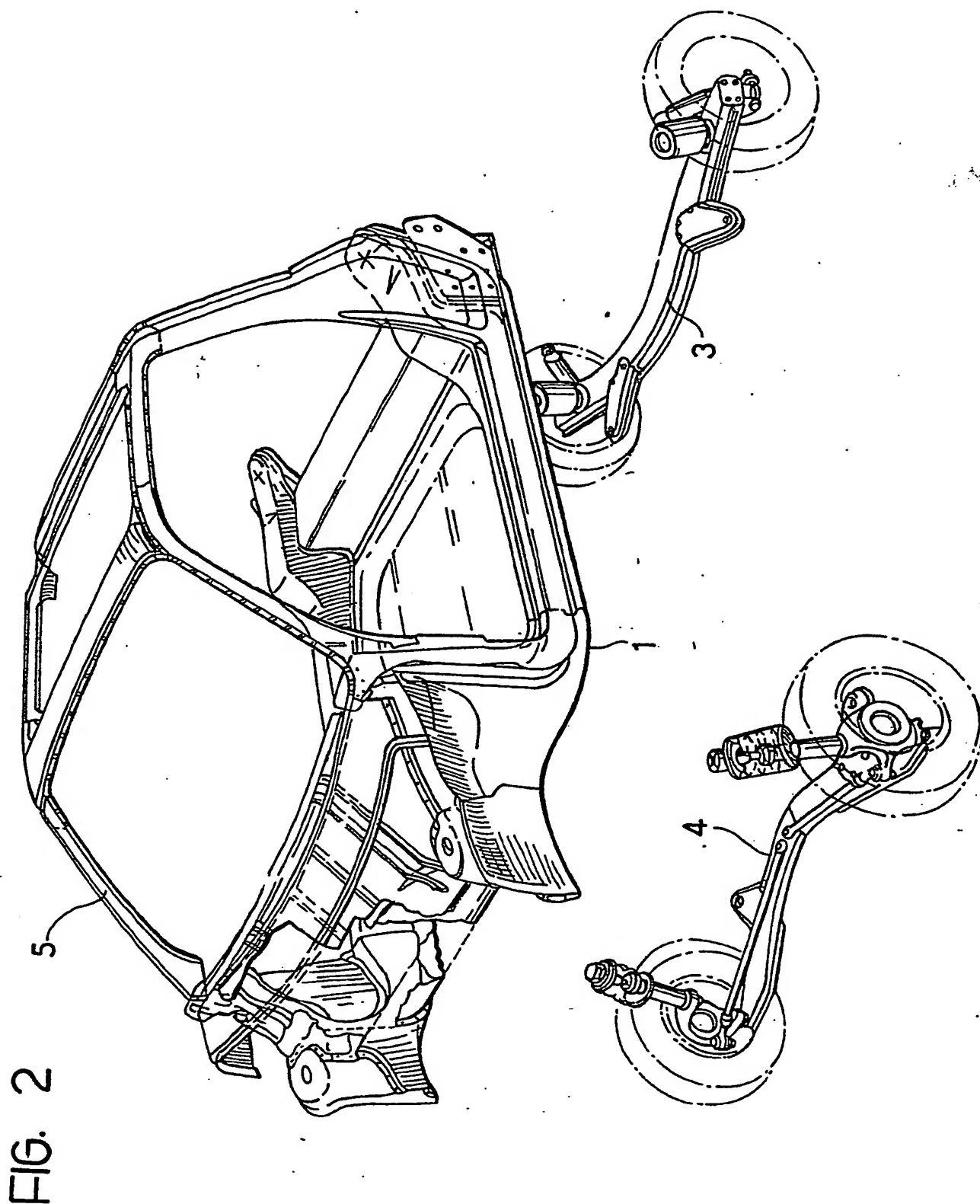
- 5 - assembling a body (2) constituted by pre-assembled and finished sub-units including body elements (6,7) of moulded plastics material defining at least the roof and the sides of the vehicle,
- 10 - joining the body (2) and the load-bearing platform (1) by automated fixing techniques with adhesives and with the possible aid of mechanical connections other than welding which requires further painting and rust-proofing treatments,
- 15 - assembling the mechanical power units as well as the functional units and internal equipment of the vehicle before or after the joining of the body (2) to the load-bearing platform (1),
- 20 - attaching any pre-assembled and finished parts for completing the front and rear of the body.

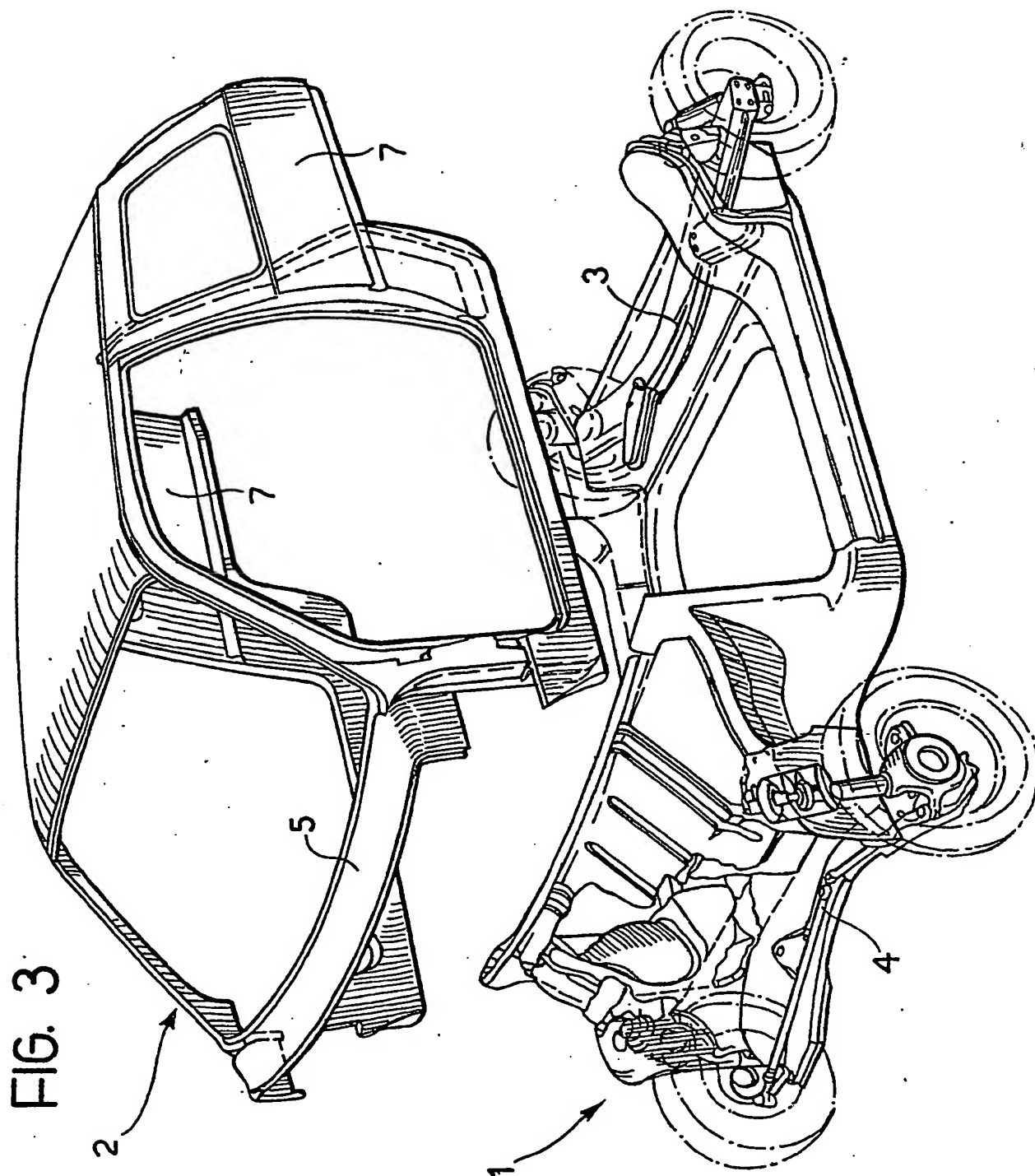
5. Method according to Claim 4, characterised in that the step of assembling the body (2) consists of providing a metal support framework (5) and attaching the elements (6,7) of moulded plastics material to this
25 metal framework.

6. Method according to Claim 4, characterised in that the step of assembling the body (2) consists of providing the elements (6,7) of moulded plastics material with metal support members and joining the
30 elements (6,7) of moulded plastics material so as to form a support framework (5) with the metal members.

7. Method according to Claim 5, characterised in that the elements (6,7) of moulded plastics material are assembled beforehand to constitute a pre-assembled sub-unit (8) which is subsequently joined to the metal framework (5).

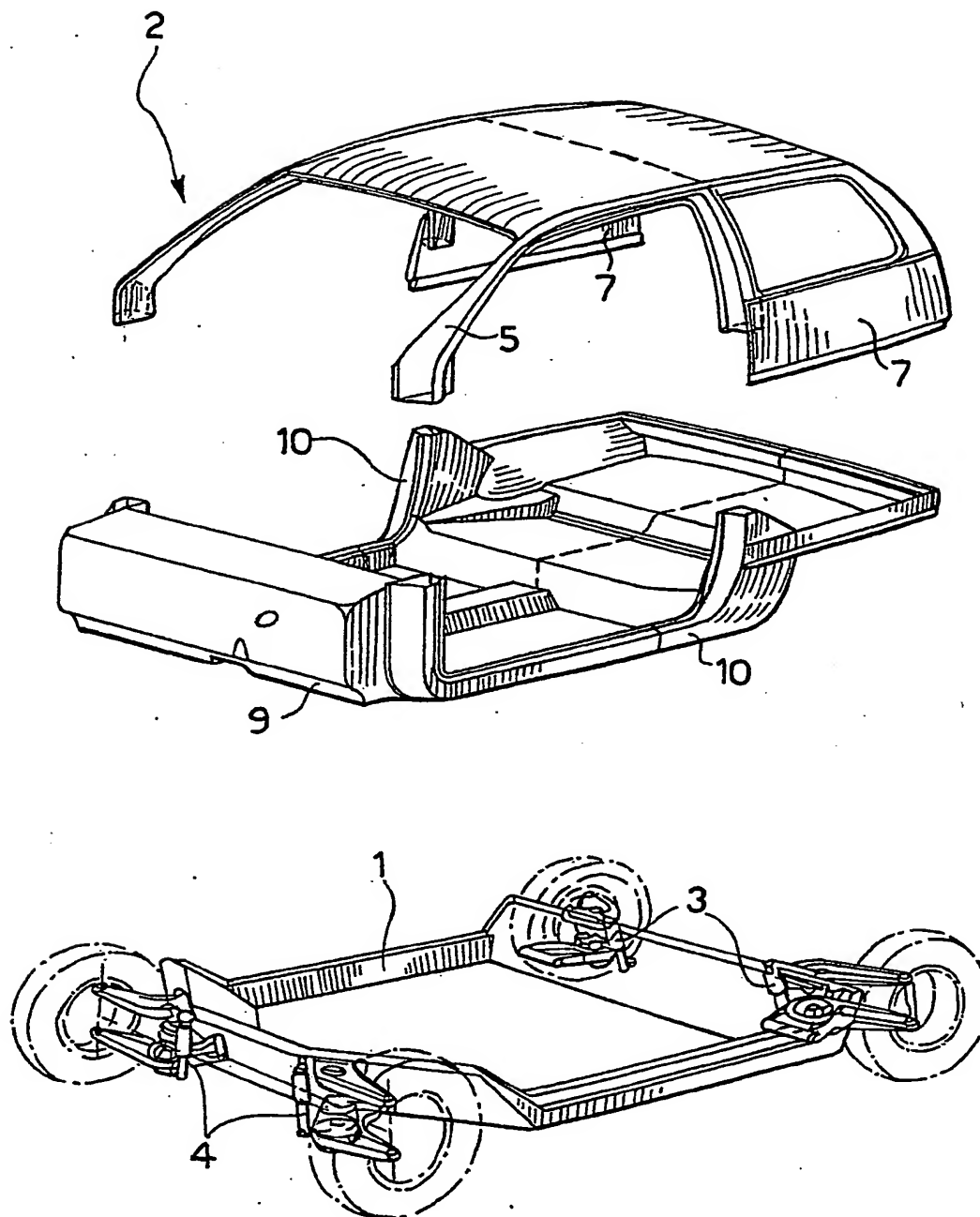
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FIG. 1





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FIG. 4





European Patent
Office

EUROPEAN SEARCH REPORT

0240470

Application number

EP 87 83 0089

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|---|---|--|---|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.4) |
| A | FR-A- 839 618 (AUTO-UNION) * Page 3, lines 23-34; abstract points 1,2 * | 1,5 | B 62 D 29/04 |
| A | --- US-A-4 438 971 (GENERAL MOTORS) * Column 1, line 59 - column 2, line 29 * | 1,3 | |
| A | --- DE-A-2 923 874 (AUDI NSU) * Columns 1,2,5; page 8, last paragraph * | 1,2 | |
| A | --- GB-A-1 237 615 (FORD) * Columns 1,7,9 * | 1,5 | |
| | | | TECHNICAL FIELDS SEARCHED (Int. Cl.4) |
| | | | B 62 D |
| The present search report has been drawn up for all claims | | | |
| Place of search THE HAGUE | | Date of completion of the search 25-06-1987 | Examiner SCHMITTER J.M. |
| CATEGORY OF CITED DOCUMENTS | | | |
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